ADEQ Arizona Department of Environmental Quality

STATEMENT OF BASIS

STATEMENT OF BASIS FOR MAJOR MODIFICATION OF ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NO. AZ0020249

Pursuant to A.C.C. R18-9-B906, on August 31, 2018, ADEQ received a letter from the City of Globe to modify AZPDES Permit No. AZ0020249 for the Pinal Creek Wastewater Treatment Plant (WWTP). The request is to:

1. Establish acute and chronic discharge permit limits and Whole Effluent Testing (WET) criteria based upon the intermittent discharges of the facility; and
2. Include a site specific limit for copper based upon a translator study.

The Pinal Creek WWTP is a Publicly Owned Treatment Works (POTW). The receiving water for Outfall 001 is Pinal Creek in the Salt River Basin with the designated uses of Aquatic and Wildlife effluent dependent water (A&Edw) and Partial Body Contact (PBC). The City of Globe entered into a Consent Order (WS-07-17) with ADEQ on December 5, 2017, to address on-going exceedances of their copper discharge limits beginning in April 2016. The following table is a list of changes made to the permit.

Current Permit	Modification	Reason for Change
Copper Limit with no translator	Site-specific translator for Copper Limits	City of Globe submitted a copper translator study to support the development of a site specific permit limit.
Limit Tables based upon the design flow of the facility	Tiered Permit Tables based upon the frequency and duration of discharge. Limits were removed from Table 1.b. for cyanide, lead, selenium, and 2,4,6 – Trichlorophenol. Limits were changed for copper, zinc, and 2,4-Dinitrophoenol.	Reflects the actual discharges occurring at the facility. This also includes an evaluation of reasonable potential based upon the Acute Water Quality Standards. See Acute Reasonable Potential Table for reasoning behind the permit limit changes.
Chronic WET testing	Acute and Chronic WET dependent on length of discharge	Allows for acute WET testing when the duration of discharge does not allow for chronic toxicity.
Ammonia Impact Ratio (AIR)	Change Daily Maximum Concentration from 1 to 2.	Acute standard was developed for Ammonia.

Establishment of Separate Acute and Chronic Effluent Limitations:

Under the compliance schedule of the Order, the City of Globe implemented an agreement with a local mine to divert effluent for reuse and reduce the point-source discharge from the WWTP with the exception of intermittent discharges due to emergency situations or planned maintenance activities. The construction of the diversion was completed on July 31, 2018.

As allowed under 40 CFR § 122.45(e) for non-continuous dischargers, ADEQ has developed the draft permit establishing permit limits using the chronic and acute water quality standards depending on the duration and frequency of the discharges. For short-term and infrequent discharges (defined in the permit as discharges that are less than 7 consecutive days with at least 30 days between discharges) maximum daily limitations using the acute criteria only are set and are required to be sampled 1x during a discharge event.

ADEQ is also adding the requirement to conduct acute whole effluent toxicity (WET) testing, in lieu of chronic WET, when the duration of the discharge does not allow chronic tests to be conducted.

Copper Translator Study:

In accordance with 40 CFR 122.45(c), all effluent metals concentrations, with the exception of chromium VI, shall be measured as "total recoverable metals". The Arizona water quality criteria sets the standard for metals in the dissolved fraction. As described in the EPA technical support document titled *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion*, because chemical differences between the discharged effluent and the receiving water are expected to result in changes in the partitioning between dissolved and adsorbed forms of metal, an additional calculation using what is called a translator is required. The translator calculation answers the question of what faction of metal in the effluent will be dissolved in the receiving water.

Under the Consent Order, the City of Globe agreed to conduct a copper translator study to develop a site specific copper limit in this major modification of the permit. For cases in which a standard for a dissolved metal is written as an effluent limit in terms of the total recoverable metal, the translator provides an estimate of the total recoverable concentration that achieves the dissolved standard. The most direct procedure for determining a site-specific metal translator is written in the formula below.

$$Fd = {}^{Cd}/_{Ct}$$

$$Cd = Concentration\ Dissolved$$

$$Ct = Concentration\ Total$$

$$Fd = Dissolved\ Metal\ Fraction$$

The site specific copper translator (Fd) was determine to be 0.64 using the geometric mean of the copper concentration 200 ft. downstream of the discharge. The table below summaries the data and calculation used to develop the site specific copper translator. If the permitee intends that the site-specific metal translator to be used in future AZPDES permit development, the permittee shall conduct a new site-specific metal translator study to be completed and approved by ADEQ prior to and submitted with the next permit application.

Sample #	Sample Collection Date	Point of Discharge			200 ft. Downstream		
		Total Copper Outfall 001	Dissolved Copper Outfall 001	Hardness	Total Copper Downstream	Dissolved Copper Downstream	Hardness
1	10/17/2017	29	18	110	29	18	120
2	10/24/2017	25	14	130	25	15	130
3	10/31/2017	28	14	120	25	15	120
4	11/7/2017	14	11	110	16	12	120
5	11/14/2017	34	14	140	36	14	130
6	11/21/2017	20	10	120	20	11	120
7	11/28/2017	7.3	4.6	130	7.5	4.9	130
8	12/5/2017	6.5	5	130	7	5.8	130
9	12/12/2017	14	8.8	130	15	8.9	130
11	12/19/2017	11	8.3	130	12	8.5	130
12	12/26/2017	9.1	7.7	120	9.5	8.4	130
13	1/2/2018	8.6	6.4	120	9.3	5.8	120
14	1/16/2018	11	6.2	130	10	6.5	130
Mean		16.731	9.846	124.615	17.023	10.292	126.2
Median		14	8.8	130	15	8.9	130
GEO Mean		14.4667	9.0644	124.3258	14.8735	9.4946	126.06

Permit Limitations and Monitoring Requirements:

The table that follows summarizes the parameters that are limited for infrequent discharges and the rationale for that decision. Also included are the parameters that require monitoring without any limitations or that have not been included in the permit modification at all and the basis for those decisions. The corresponding monitoring requirements are shown for each parameter. In general, the regulatory basis for monitoring requirements is per 40 CFR §122.44(i) *Monitoring requirements,* and 40 CFR §122.48(b), *Required monitoring*; all of which have been adopted by reference in A.A.C. R18-9-A905, *AZPDES Program Standards*.

Ammonia Impact Ratio (AIR):

The AIR Daily Maximum was changed from 1 to 2 in Table 1.a. Ammonia water quality criteria vary based on the effluent pH and temperature at the time of effluent sampling. As a result, no single ammonia concentration can be included as a permit limit. To overcome this, an Ammonia Impact Ratio (AIR) was created in the permit. The AIR is calculated by dividing the ammonia concentration in the effluent by the applicable ammonia standard based on the effluent pH and temperature at the time of sampling. The AIR average monthly limit (AML) and the maximum daily limit (MDL) were previously both set at 1 in the permit. The development of the AML and MDL was developed using the "two-value steady state waste load allocation" described on page 99 of the *EPA Technical Support Document for Water-Based Toxic Controls* (TSD).

Infrequent Discharges Reasonable Potential Tables 1.b. and Table 2.b.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Proposed Monitoring Requirement/ Rationale (1)
Ammonia	Standard varies with pH	0.49 mg/L	24	N/A	No RP	No limit for infrequent discharges.
Oil & Grease	10 mg/L	6.3 mg/L	8	N/A	No RP	No limit for infrequent dsicharages.
Copper (3)	25 µg/L/ A&Wedw acute	210 µg/L	27	441 µg/L	RP Exists	Monitoring required and a limit is established for infrequent discharges.
Cyanide	41 µg/L/ A&Wedw acute	7.4 µg/L	13	19.98 µg/L	No RP	No limit for infrequent discharges.
Hydrogen Sulfide	No applicable standard	N/A	0	N/A	No RP	No monitoring required for infrequent discharges.
Iron	No applicable standard	Not required in previous permit	--	--	RP Indeterminate (No Data)	No monitoring is required for infrequent discharges.
Lead (3)	15 µg/L / PBC	5.2 µg/L	14	13.52 µg/L	No RP	No limit for infrequent discharges.
Selenium	4667 µg/L/ A&Wedw chronic	4.4 µg/L	14	11.4 µg/L	No RP	No limit for infrequent discharges.
Sulfides	No applicable standard	<100 µg/L	14	N/A	N/A	No monitoring is required for infrequent discharges.
Zinc (3)	133 µg/L/ A&Wedw acute	110 µg/L	14	286 µg/L	RP Exists	Monitoring is required and a limit is established for infrequent discharges.
2,4-dinitrophenol	110 µg/L/ A&Wedw acute	<60 µg/L	4	141 µg/L	No RP Exists	No monitoring is required for infrequent discharges.
2,4,6-Trichlorophenol	130 µg/L/ A&Wedw acute	<21 µg/L	4	49.35 µg/L	No RP Exists	No monitoring is required for infrequent discharges.

Footnotes:

(1) The water quality used for the reasonable potential analysis are the acute water standards for short-term and infrequent discharges.
(2) The monitoring frequencies are as specified in the permit.
(3) Hardness-dependent metal - the standard for this parameter is based on the average hardness value of the effluent as indicated above.

Anti-Backsliding Considerations:

"Anti-backsliding" refers to statutory (Section 402(o) of the Clean Water Act) and regulatory (40 CFR 122.44(l)) requirements that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the previous permit. The rules and statutes do identify exceptions to these circumstances where backsliding is acceptable. This permit has been reviewed and drafted with consideration of anti-backsliding concerns. 40 CFR 122.44(l)(2)(i)(B)(1) allows a permit to be modified to contain a less stringent effluent limitation if information becomes available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance. This permit modification is not removing limitations from the permit, but establishing different limitations to two different types of discharges (continuous discharges vs. infrequent / short-term discharges). A reasonable potential analysis was completed to establish limitations for both cases.

Public Notice (A.A.C. R18-9-A907) / Public Comment Period:

These changes are considered a major modification. This proposed modification will be public noticed for a 30-day comment period prior to issuance of the final permit decision.

EPA Review (A.A.C. R18-9-A908(C))

A copy of this draft permit modification any revisions made to this draft as a result of public comments received will be sent to EPA Region 9 for review. If EPA objects to a provision of the draft, ADEQ will not issue the permit until the objection is resolved.

Information Sources:

While developing effluent limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

1. August 30, 2018, letter from City of Globe requesting permit modification.

2. ADEQ files on City of Globe, Pinal Creek WWTP.

3. Information provided to ADEQ staff in response to Consent OrderWS-07-17.

4. Arizona Administrative Code (AAC) Title 18, Chapter 11, Article 1, *Water Quality Standards for Surface Waters,* adopted December 31, 2016

5. A.A.C. Title 18, Chapter 9, Article 9. *Arizona Pollutant Discharge Elimination System* rules.

6. Code of Federal Regulations (CFR) Title 40:
   Part 122, *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System.*
   Part 124, *Procedures for Decision Making*.
   Part 133. *Secondary Treatment Regulation.*
   Part 503. *Standards for the Use or Disposal of Sewage Sludge*.

7. EPA Technical Support Document for Water Quality-based Toxics Control dated March 1991.

8. *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*, US EPA, May 31, 1996.

9. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA /821-R-02-013).

10. U.S. EPA NPDES Permit Writers' Manual, September 2010.

11. City of Globe, *Copper Translator Study Report,* July 11, 2018